United States Patent [19]

Shannon

[11] **Patent Number: 4,928,714**

[45] **Date of Patent: May 29, 1990**

[54] **SMOKING ARTICLE WITH EMBEDDED SUBSTRATE**

[75] Inventor: **Michael D. Shannon, Winston-Salem, N.C.**

[73] Assignee: **R. J. Reynolds Tobacco Company, Winston-Salem, N.C.**

[21] Appl. No.: **723,382**

[22] Filed: **Apr. 15, 1985**

[51] Int. Cl.[5] **A24D 1/18; A24D 1/00; A24D 1/02**

[52] U.S. Cl. **131/359;** 131/273; 131/335; 131/196; 131/360

[58] Field of Search 131/360, 364, 194, 273, 131/356, 337, 335, 329, 362, 364

[56] **References Cited**

U.S. PATENT DOCUMENTS

Re. 27,214	11/1971	Nakahara .
1,529,181	12/1924	Holmes .
2,907,686	10/1959	Siegel .
3,258,015	6/1966	Ellis .
3,356,094	12/1967	Ellis .
3,516,417	6/1970	Moses .
3,738,374	7/1973	Bennett .
3,943,941	4/1976	Boyd .
4,044,777	8/1977	Boyd .
4,079,742	4/1978	Ranier .
4,284,089	8/1981	Ray .
4,286,604	9/1981	Ehretsmann .
4,326,544	4/1982	Hardwick .
4,340,072	7/1982	Bolt .
4,347,855	9/1982	Lanzilloti et al. .
4,391,285	7/1983	Burnett et al. .
4,407,308	10/1983	Baker .
4,474,191	10/1984	Steiner .

FOREIGN PATENT DOCUMENTS

276250	1/1964	Australia .
0117355	9/1984	European Pat. Off. .
1294351	9/1975	Fed. Rep. of Germany .
2057421	12/1984	France .
2057422	12/1984	France .
35-9894	5/1960	Japan .
42-8684	12/1967	Japan .
1431045	4/1972	United Kingdom .

OTHER PUBLICATIONS

Influence of Filter Additives on Smoke Composition, Rec. Adv. Tob, Sci., 4:47 (1978) M. L. Reynolds.

L. L. Lyerly, "Direct Vapor Chromotographic Determination of*** Triacetin in Cigarette Smoke," Tob Sci. 11:49 (1967).

J. E. Kiefer, et al., "Factors That Affect Elution of Plasticizer from Cigarette Filters", Eastman Kodak Publ. No. FTR-65.

Guinness World Book of Records, pp. 242-243 (1985 Edition).

Guinnes World Book of Records, p. 194 (1966 Edition).

C. Hagg, General Inorganic Chemistry, at p. 592 (John Wiley & Sons, 1969).

Ames et al., Mut. Res. 31: 347-364 (1973).

Nago et al., Mut. Res. 42:335 (1977).

Hach's Chem. Dictionary, 34, 4th ed. (1969).

Lange's Handbook of Chemistry, 10: 272-74 (11th ed. 1973).

U.S. Pat. No. 4,347,855 (9/82) Lanzilloti et al.

U.S. Pat. No. 4,391,285 (7/83) Burnett et al.

U.S. Pat. No. 4,474,191 (10/84) Steiner.

U.S. Pat. No. 4,219,031 (8/80) Ranier.

U.S. Pat. No. 3,614,956 (10/71) Thornton.

Marshall Sittig, Tobacco Substitutes, Noyes Data Corp. (1976).

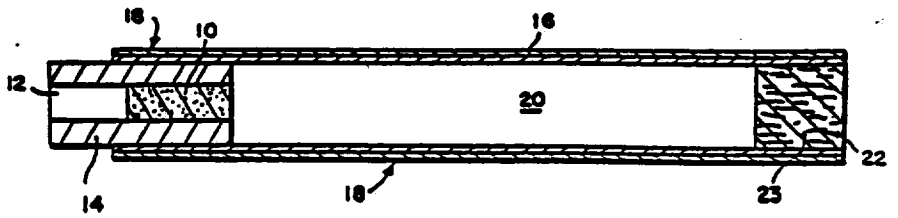
Primary Examiner—V. Millin

Attorney, Agent, or Firm—Grover M. Myers; David G. Conlin

[57] **ABSTRACT**

The smoking article of the present invention has a short, combustible, preferably carbonaceous, fuel element, generally less than about 30 mm long, which is substantially free of volatile organic material. A physically separate aerosol generating means, preferably comprising a substrate bearing an aerosol forming substance, is located within a cavity in the fuel element, i.e., the aerosol generating means is at least partially embedded in the fuel element. This article may be provided with an external insulating member to reduce radial heat loss and/or with a heat conducting member to increase conductive heat transfer from the fuel element to the aerosol generating means.

28 Claims, 1 Drawing Sheet



RECEIVED
PHILIP MORRIS MANAGEMENT CORP.
LAW DEPT.—PATENT SECTION

JUN - 4 1990

2021391969

Source: https://www.industrydocuments.ucsf.edu/docs/rkkl0000